

REMARKS

Claims 1 to 5 and 8 to 19 are pending. Claim 19 is new and being prosecuted. Claims 6 and 7 have been withdrawn. No claims are allowed.

Claim 1 has been amended to remove the "optional" language. Claim 19 sets forth the optional language in a dependent claim.

Claim 1 has also been amended to call for the "essentially free" language so that the limitations are consistent in the claim.

Claims 1 to 5, 8 to 12 and 14 to 17 were rejected under 35 USC 103(a) as being unpatentable over Janesen et al (U.S. Patent No. 4,925,701), in view of Desphandey et al (U.S. patent No. 4,961,958), in further view of Asmussen et al (U.S. patent No. 5,311,103). This rejection is traversed.

The present invention resides in the discovery that in order to prepare nanocrystalline diamond in the type of reactor specified in the preamble, the conditions set forth in independent Claim 1 must be met. None of the references suggest a plasma

and chamber for generating the nanocrystalline diamond which must be (1) essentially free from oxygen or nitrogen in the plasma, and (2) without leaching into nitrogen or oxygen into the chamber of the apparatus.

Janesen et al (U.S. Patent No. 4,925,701) does not describe the preparation of nanocrystalline diamond. The reactor described is not of the type used in Applicants' process and uses heated filaments. The gases used were hydrogen and a carbon source, rather than a 90% or more argon plasma as set forth in Claim 1. About the only part of the reference which is relevant is roughening the surface which is old. Column 11, lines 32 to 55 have nothing to do with the processing of the diamond and are related to testing the film produced from the process.

Desphandey et al (U.S. Patent No. 4,961,958) describes a chamber which uses a heated filament 46 which is a different type reactor apparatus. Carbon is evaporated in the presence of hydrogen for deposit of diamond on a substrate. Column 5, lines 30 to 42 discloses "enhancing" the deposition of diamond with

argon. Nothing approaching 90% or more of argon with the optional use of hydrogen as in the claims is suggested.

Asmussen et al ('103) describes the type of reactor included in the claims; however, there is no disclosure of the process claimed as discussed above.

Thus the combination of references would not possibly produce the claimed process. Reconsideration of this rejection is requested.

Claims 13 and 18 were rejected under 35 USC 103(a) as unpatentable over previously applied references in view of Herb et al (U.S. Patent No. 5,273,790). The patentability of these claims depends upon the independent claims which these claims depend. The specific limitations of Claims 13 and 18 are merely preferred. Reconsideration of this rejection is requested.

Claims 1-5, 8-12, 14 to 17 were rejected over Janesen et al (US 4,925,701), in view of Desphandey et al (US 4,961,958), in further view of Asmussen et al (U.S. '668). Asmussen et al (U.S. Patent 4,585,668)

describes a reactor of the type described in Asmussen ('103). The arguments previously presented apply equally to this combination of references. Reconsideration of this rejection is requested.

Claims 13 to 18 were rejected under 35 USC 103(a) over Janesen et al (US 4,925,701), in view of Desphandey et al (US 4,961,958), in further view of Asmussen et al (US 4,585,668), and further in view of Herb et al (US 5,273,790). The points as to Claims 13 and 18 are set forth above apply to this rejection as well. Reconsideration is requested.

Claims 1 to 5, 8 to 12 and 14 to 17 were rejected over Janesen et al (US 4,925,701), in view of Desphandey et al (US 4,961,958), in further view of Asmussen et al (US 4,906,900). The Asmussen et al ('900) reference merely describes another type of reactor of the type used in the claimed process. The disclosures of Janesen et al and Desphandey have been discussed above. The combination of references does not teach the claimed invention. Reconsideration is requested.

Claims 13 and 18 were rejected under 35 USC 103(a) as being unpatentable over Janesen et al (US 4,925,701), in view of Desphandey et al (US 4,961,958), in further view of Asmussen et al (US 4,906,900), as applied to claims 1 and 2 above, and further in view of Herb et al (US 5,273,790). The points made as to these claims are set forth above and apply to this rejection as well. Reconsideration is requested.

Claims 1-5, 8-12 and 14-17 were rejected over Janesen et al (US 4,925,701), in view of Desphandey et al (US 4,961,958), in further view of Asmussen et al (US 4,727,293). Asmussen '293 describes the type of reactor used by Applicants. Janesen et al and Desphandey et al have been discussed previously and combined with Asmussen et al ('293) could not possibly produce the claimed invention.

Claim 13 and 18 were rejected under 35 USC 103(a) over Janesen et al (US 4,925,701), in view of Desphandey et al (US 4,961,958), in further view of Asmussen et al (US 4,727,293), as applied to Claims 1 and 2 above, and further in view of Herb et al (US

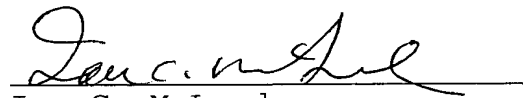
Attorney Docket No. MSU 4.1-572
Appl. No. 10/073,710
Amdt. Dated: July 29, 2004
Reply to Office Action of 05/04/2004

5,273,790). The points previously made as to Claims 13 and 18 apply to this rejection as well. Reconsideration is requested.

The rejection is using hindsight in an attempt to reconstruct the claimed invention, which is a process. The reactor is known as described in the Asmussen et al patents. The need for strict removal of nitrogen and oxygen from the plasma was not recognized by Asmussen et al or any of the other references. One skilled in the art could not have derived the claimed invention from the combinations of references cited.

It is believed that Claims 1 to 5 and 8 to 18 are in condition for allowance. Notice of Allowance is requested.

Respectfully,



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